

ILLUMINATING ENGINEER

XXV

August, 1932

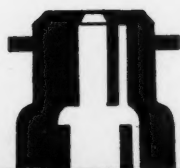
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INDEX

	PAGE		PAGE
EDITORIAL NOTES :—		Illumination and Entertainment	198
Industrial Lighting—The Penetrating Power of		LIGHTING LITERATURE <i>AUG. 21 1932</i>	199
Motor-car Headlights... ..	193	DIRECTORY OF LIGHTING EQUIPMENT	204
NOTES AND NEWS ON ILLUMINATION	194	"Daylight" Artificial Lighting in an Artist's Studio	206
THE PHYSICAL AND OPTICAL SOCIETIES :—		TRADE NOTES	208
Joint Discussion on Vision	195		
THE ASSOCIATION OF PUBLIC LIGHTING ENGINEERS :—			
Ninth Annual Meeting and Conference	197		

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<small>OFFICIAL JOURNAL of</small> The Illuminating Engineering Society <small>(Founded in London, 1909; Incorporated 1930)</small> <small>and of</small> THE ASSOCIATION OF PUBLIC LIGHTING ENGINEERS <small>(Founded 1928; Incorporated 1928)</small>		

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Industrial Lighting

REPORTS of H.M. Inspector of Factories in general rather foster the impression that industrial lighting has advanced considerably during recent years. Taking a wide view of the British Isles this impression is doubtless correct. There has been notable progress. Many admirable installations have been carried out in recent years. No one now approves conditions which were usual 20 years ago.

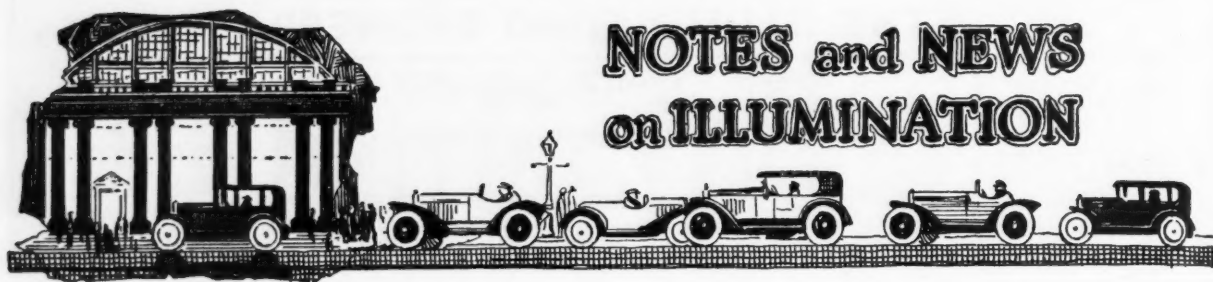
Nevertheless it is to be feared that in some areas, and especially in the case of industries that have been going through hard times, improvement has been small. An indication of this is given in the report of H.M. Inspector of Factories for 1931, in which reference is made to a recent investigation by Mr. P. E. Shopland.* In more than 200 factories visited in the ironfounding, light engineering and textile industries there were few with really satisfactory installations. Glare, due to unshaded or unsuitably placed sources, was common. More than half of the readings showed readings of $1\frac{1}{2}$ foot-candles or less, only 11 per cent. attaining to the reasonable standard of 5 foot-candles or more. The results of inspection are the more disappointing because they afford a comparison with the record taken for the Departmental Committee nearly 20 years ago, and reveal so little improvement. Specific cases of poor installations are mentioned. Perhaps the most singular is the brewery mentioned by Miss Johnson, "where the lighting is partly by means of candles held in spikes which are dumped into conveniently placed sockets about the works and are used by the workers as they move from place to place." Another instance was afforded by a factory in which women were working on dark cloth, and it seemed almost impossible for them to produce good work with the light available. Owing to bad trade the firm were unwilling to put in a new installation (the existing system was installed 35 years ago!). New shades have, however, been fitted.

It is small wonder that visitors from overseas were dismayed by the lighting conditions in certain factories visited in the course of the International Illumination Congress. The missionary work of inspectors of factories has helped towards bringing light into darkness. But it seems evident, in spite of the energetic propaganda of recent years, that very much remains to be done.

* Some of these records were presented in a paper read by Mr. Shopland before a meeting of the Illuminating Engineering Society in Birmingham on March 14th. (*Illum. Eng.*, May, 1932, pp. 129-132.)

The "Penetrating Power" of Motor Headlights

FROM time to time one hears claims on behalf of certain lamps or appliances that they yield light possessing exceptional "penetrating power," especially in a foggy atmosphere. Sometimes "daylight" lamps are credited with good performance in this respect; more often the claim is based on the use of yellow-tinted screens or reflectors. At the meeting of the International Commission on Illumination, held at Cambridge in September last, a resolution affirming that colour of light has little material influence on penetrating power was passed. It has always seemed to us that a number of quite distinct phenomena are included under this phrase "penetrating power." This perhaps helps to explain the contradictory views expressed. We can quite believe that so far as penetrating power in a literal sense is concerned (i.e., the power of the headlight beam to pass through mist or fog), colour has not a great influence. One would expect the red end of the spectrum to be somewhat better in this respect, but in anything approaching a real fog any beam of light is almost impotent. In a somewhat hazy but not foggy atmosphere the apparent penetrating power of a yellow beam may be due in a measure to the fact that less light is scattered by the mist intervening between the eye and the object viewed, so that the luminous veil which impairs visibility is less pronounced. Observation of the blue colour of distant dark objects (woods, mountains, etc.) supports the belief that the blue element in daylight is filtered out by intervening particles of mist—an inconvenient phenomenon to photographers. It is now many years since Professor Wood, of Columbia University, showed how effective views of remote landscapes can be taken by using plates sensitive only to infra-red rays. Hence, if blue light is eliminated from the beam of a headlight, there may be less scattering to vex the driver. It would seem, however, that the advantage of yellow light in this respect is gained most easily, not by altering the colour of the beam but by the insertion of a yellow glass screen in front of the driver's eyes, as is already done on some of the L.C.C. tramcars. The writer's impression is that, even in clear weather, distant objects viewed through this yellow glass screen appear sharper than they do through the clear glass; this may be due partly to elimination of veiling haze, but is almost certainly also connected with another effect—the difficulty experienced by many (especially myopic) eyes in focussing distant blue light.



NOTES and NEWS on ILLUMINATION

National Physical Laboratory

ANNUAL VISIT.

The usual annual visit to the National Physical Laboratory, which took place on June 28th, offered an opportunity of learning something of the extraordinary variety of investigations carried on—we notice tests on such widely different topics as the acoustics of the League of Nations Hall and the spreadability of butter! Of chief interest to our readers are the work of the photometric department, and the various researches on special problems in illumination. It is interesting to observe the increased use being made of photoelectric cells in connection with precision photometry and the development of such new devices as the photometric pupillometer. The measurements of natural illumination in model rooms, and the continuous recording of daylight continued to attract interest. Various fundamental researches on contrast-effects and glare have been proceeding. The laboratory has been engaged in the usual routine work of maintaining standards of candle-power, as well as other standards of international interest. We were glad to learn that research on the incandescent primary standard of light is developing in a promising way; naturally the problem of maintaining a constancy of light to within 1/10th per cent. is an exceedingly difficult one. One also observes with interest the development of experimental acoustics—a field in which research is certainly needed. It will be recalled that the construction of a special acoustics building was commenced in the autumn of 1931, and such points as the elimination of extraneous ground vibrations are now receiving study.

Accidents in the Streets

A bulletin issued by the National Safety-First Association draws attention to several points of interest in the recently issued Home Office statistics of street accidents for 1931. As compared with 1930, 614 fewer people were killed, but 24,224 more were reported injured—a somewhat curious result which is attributed to the fact that the police obtain particulars of a larger proportion of minor personal accidents than in former years. This condition seems to apply generally in country districts, where the new motor patrols are active and the provisions of the Road Traffic Act mainly apply. In the two biggest cities, London and Glasgow, on the other hand, decreases in both killed and injured were reported. When these figures became known they were regarded as encouraging. Unfortunately the data so far available for the present year are much less satisfactory. In London the official figures show an increase of over 8 per cent. in the number killed in the first quarter of 1932, as compared with the same quarter for 1931, and for Great Britain as a whole the National Safety-First Association's returns from chief constables show an increase of over 20 per cent. The problem is certainly a serious one, and we are glad to note that it is receiving investigation at the hands of a committee of the Association.

The Lighting of School Buildings

We have received from the National Union of Teachers a bulletin summarizing the addresses of Mr. John Sargent and Mr. A. H. Seymour on School Buildings, presented at the recent meeting of educational authorities at Folkestone. Mr. Sargent remarks, truly enough: "It is difficult to see why the buildings in which we keep our money or our beer should be either finer or fitter for their purpose than those in which we keep our children," and he comments on the tendency of school buildings to resemble an institution or a hospital or "the unsanctified version of some ecclesiastical edifice." The contribution of Mr. A. H. Seymour, who is associated with the National Institute of Industrial Psychology, deals with lighting and ventilation. In the introductory part of his paper he remarks that "the school medical authorities in Essex had already come to the conclusion that physiologically grave results accrue from the lack of suitable lighting." Many of us who are convinced of the vital importance of good lighting in schools have experienced some difficulty in finding scientific evidence in proof of the above assertion, and one would like to have learned something of the data on which it is based. Mr. Seymour suggests an illumination of between 8 and 10 foot-candles, presumably as a guide to artificial lighting. His ideas are illustrated by various diagrams showing variations in illumination in schoolrooms and by various charts taken from Mr. Luckiesh's recent book. The paper, rather curiously, makes no reference to the daylight factor as a standard of access of daylight, nor to the reports recently issued by the Illuminating Engineering Society, in which both natural and artificial lighting conditions in schools are fully treated.

Terms used in Illumination and Photometry

It is of interest to observe that a new edition of the "British Glossary of Terms used in Illumination and Photometry" (No. 233, 1932) has recently been issued by the British Standards Institution. This is the first revision that has taken place since the glossary was compiled in 1925. Upwards of sixty terms are defined. This is now a valuable publication which no illuminating engineer can afford to neglect. Copies (post free 2s. 2d.) may be obtained from the British Standards Association, 28, Victoria Street, London, S.W.1.

Mrs. Cloudesley Brereton

Readers will doubtless have observed the announcement that Mrs. Cloudesley Brereton, whose name is closely associated with Public Health, and who during the past twenty years has acted as the Consultant and Editor of Publications to the British Commercial Gas Association, has recently relinquished the national editorial work, and will in future confine herself to the functions of consultant. All gas matters referred to her personally as consultant and letters on public health and professional matters should now be addressed to her at 32, Victoria Street, London, S.W.1.

The Physical and the Optical Societies

Joint Discussion on Vision

THE joint meeting of the Physical and the Optical Societies, held on June 3rd in South Kensington, was one of special interest to readers of this journal in that the subject under consideration was the visual process in all its aspects. No less than 27 papers were read and discussed during the afternoon and evening devoted to the meeting. They will be published in full by the Societies, but a brief account of their contents will no doubt be of interest to our readers.

COLOUR AND COLORIMETRY.

The first afternoon session was entirely devoted to the problems of colorimetry and the phenomena of colour vision.

Professor Frank Allen, of Winnipeg, in his paper on "The Trichromatic Theory and its Explanatory Power," gave an account of the way in which the theory of Young, as developed by Helmholtz, accounted for experimental results on the sensitivity of the eye after it had been fatigued with light of various colours. He showed that the experimental evidence all led to the conclusion that the three fundamental sensations were red, green and violet, yellow and white being compound sensations. The production of white by various mixed stimuli and the relations between spectral complementaries were dealt with in one section of his paper, while the Purkinje effect, the phenomena of contrast and of abnormal colour vision were all touched upon briefly.

Professor F. Drever, of the Psychological Laboratory, Edinburgh, presented a paper entitled "The Fundamental Colours and the Colour Triangle," in which he gave a critical account of the determinations of the primary colours, as carried out by various investigators. He pointed out that one of the primaries was necessarily placed in the yellow (at about 570 $m\mu$) and another in the blue (at about 470 $m\mu$). No three spectral colours could be found, such that all the other spectral colours could be matched by suitable mixtures of these three. To obtain all the hues of the spectrum a fourth colour would be required.

Mr. J. Guild's paper on "The Interpretation of Quantitative Data in Visual Problems" was concerned with measurement and the interpretation of measurements made in colorimetry and in photometry. He summarized the first part of his paper as follows:—

"If a relational entity enters into experience in such a way that we can apply to it the conception of greater and less, a criterion must exist by virtue of which quantities of it can be regarded as of equal magnitude. If we are able to incorporate this criterion in an *experimental* process by which to establish a series of such equal quantities, we may or may not be able to establish a quantitative scale of magnitude, on which quantities of the entity may be numerically expressed as a number of units. We shall be able to do so provided the relation involved in the definition of the entity remains quantitatively unaltered when the magnitude of the entity varies." He then went on to examine the application of this principle in the measurement of colour and brightness, and pointed out that the only quantities which could be measured were the stimuli.

In a paper entitled "Colour Vision," Professor H. Hartridge dealt with the sensations of colour perceived by red-blind individuals, and explained why such individuals always refer to the long-wave end of the spectrum as "yellow." Similarly, the unalter-

able character of white, as perceived by the peripheral part of the retina, was explained.

Dr. Selig Hecht, of Columbia University, presented an exhaustive paper dealing with "A Quantitative Formulation of Colour Vision." He first gave an account of the experimental data regarding the "visibility" of radiant energy, the excitation curves, complementary colours, colorimetric purity and hue discrimination. He then described a set of hypothetical colour systems built up on these experimental results, and finally he showed how, mathematically, these systems could be inter-related and brought into harmony with one another. His paper included a very useful list of references to the sources of the experimental data used.

A description of "Some Recent Experiments on the Sensitiveness of the Eye to Differences in the Saturation of Colours" was presented by Professor L. C. Martin and Messrs. F. L. Warburton and W. J. Morgan. They gave the results of some measures of the sensitiveness of the eye to differences in saturation by determining (a) the number of perceptible steps between the spectral colours and white, and (b) the photometric amplitude of the first of those steps.

Professor W. Peddie, in a paper entitled "The Essence and Present Position of the Trichromatic Theory," discussed the underlying principles of this theory and the way in which the other theories are, of necessity, related to it. In particular he dealt with dichromasy and with Dr. Houstoun's theory of the mechanism of vision.

In a paper on "The Measurability of Sensations of Hue, Brightness or Saturation," Professor L. F. Richardson described an application of the method of measuring sensations by estimating the ratio of unequal intervals, both much larger than the least perceptible interval. This method was applied to an estimation of the degree of "redness" in a "pink" material.

Some work recently carried out at the Imperial College of Science was the basis of a paper by Dr. W. D. Wright on "The Significance of Colour-Fatigue Measurements." The line of argument developed was that fatiguing the eye must result in a separate depression of its sensitivity along each of the three visual response paths. It ought, therefore, to be possible to calculate the response curves of the eye by combining measurements of fatigue with the known trichromatic distribution curves. The author limited his discussion to cone vision in the fovea.

SENSITIVENESS OF EYE AND ADAPTATION.

The second afternoon session was opened with a paper in German by A. Brückner, of Basle, entitled "Untersuchungen zur Dunkeladaptation des Menschlichen Auges." The author described experiments made with a Nagel adaptometer, using excitations of 1/10, 1/30 and 1/50 sec. duration. The curves obtained for a large number of observers showed the relation between the time allowed for adaptation (from 4 to 46 minutes) and the minimum brightness perceptible. The latter was expressed in millilux and ranged from 21 to 0.0014.

"New observations on the Weber-Fechner Law" were described by Professor R. A. Houstoun, who confirmed (for red light) his previous results that, if I is the brightness of the field of view and ΔI the least perceptible brightness difference, then $I/\Delta I$ when plotted against $\log I$ gives a Gaussian curve of error.

A paper by K. Koffka, entitled "A New Theory of Brightness-Constancy: A Contribution to a General Theory of Vision" started from the fact that the apparent "brightness" of a surface (as evaluated by the impression on the observer's eye) is much more closely related to its reflection factor than to its actual brightness as measured with a photometer.

In a paper entitled "The Sensation of Light as a Photochemical Process," Mr. D. Roaf examined the experimental results of König and Brodhun and of R. A. Houston on the Weber-Fechner law as regards their concordance with the law governing unimolecular and bimolecular chemical reactions. He found that Houston's results fitted the theoretical bimolecular curve and, further, that this curve gave results which were in agreement with S. Hecht's experiments on the visual purple and intensity-discrimination.

Dr. W. S. Stiles and Mr. B. H. Crawford presented a paper on "Equivalent Adaptation-Levels in Localized Retinal Areas." It is now customary to express the state of a particular retinal area by reference to a standard scale of stimulations, viz., either the equivalent background-brightness scale or the equivalent surround-brightness scale. The authors found that the former gave consistent results, but not the latter. They applied the system to define a coefficient for measuring the reduction of visibility due to glare.

"The Colour Triangle and Colour Discrimination" were discussed by Mr. T. Smith, of the National Physical Laboratory. He considered the spectral locus in the colour triangle defined by the International Illumination Commission last September, and correlated it with Jones's determinations of due discrimination. He pointed out that correlations of this kind could be used to infer the changes in the stimulus which correspond to differences of colour sensation, and therefore also the colorimetric properties of the stimuli which correspond to the physiologically primary colours. These colours cannot be properly determined from the data at present available.

The first evening session opened with a paper by Mr. H. Banister on "Retinal Action Time." He used the Pulfrich pendulum illusion (apparently conical path of a pendulum seen when one eye is covered with a dark glass) and measured the differences between the retinal action time for various ratios of illumination intensities. When this ratio is 20 to 1 the difference of retinal action time is about 0.018 sec., an amount which is quite appreciable. The author pointed out that the difficulties experienced in driving a motor-car at twilight are largely due to the longer retinal action time.

"A Note on the Visual Perception of Depth" was presented by Professor F. C. Bartlett, of the Psychological Laboratory, Cambridge. He treated in turn, from the point of view of the psychological factors involved, the three cases which occur in visual appreciation of depth, viz., (a) the binocular perception of depth in relation to a point of fixation at relatively near distances, (b) the uniocular perception of depth at relatively near distances, and (c) the visual appreciation of depth at distances beyond which the factors operating in (a) and (b) can come into play.

Professors C. E. Ferree and G. Rand, of the Johns Hopkins Medical School, presented a characteristically long and detailed description of the results obtained in a research on "The Refractive Conditions for the Peripheral Field of Vision." Twenty-one eyes were examined, and the refractive conditions towards the periphery were found to fall into three different groups.

Professor R. Granit, of Helsingfors University, contributed a very interesting paper on "The Physiological Significance of the Retinal Synapses." He pointed out that the retina is a nervous centre projected to the surface of the body, and the optic nerve is a central tract connecting two centres. Just as in other nervous centres, so in the retina there are confluent paths, and interaction may take place at any one to these crossing points in the two principal directions of retinal conduction. The two principal reactions which occur at points of convergence are summation and inhibition. The author described some experimental work carried out as a contribution to the elucidation of this phenomenon in vision.

A paper on "Some Problems of Vision" was presented by Sir John Parsons, who suggested that the measures at present used in the psychology of perception were probably not the most suitable—he expressed this as "trying to measure yards with a pint pot."

Professor H. Piéron, of the Collège de France, presented a paper entitled "Les Lois du Temps du Chroma," in which he described the results of some experiments on the speed with which the saturation of a colour appears to reach its steady value for continued exposure. This speed is about 25 per cent. greater for red than for blue light. The actual speed naturally depends on the degree of saturation and on the brightness of the field of view.

A paper by A. von Pflugk, of Dresden, entitled "Die Lehre von der Akkommodation im Lichte der neueren Forschung" contained a very full account of the work which has been done to determine the method by which the accommodation of the eye is effected. The author came to the conclusion that the Helmholtz theory was entirely untenable, and that it was necessary to admit the action of an external force on the lens which, in the absence of any other connection of the lens with its surroundings, can only be the pressure of the vitreous humour with the zonule unslackened. The lens, it appears, is a plastic rather than an elastic body.

The second evening session opened with a paper by Mr. R. S. Creed, on "Visual Acuity and Retinal Structure." He showed that the usually quoted agreement between (a) the separation of the retinal images of two points just separately visible and (b) the diameter of the foveal cones, was quite inadequate to explain the phenomena of visual acuity and its relation to the brightness of the visual field.

ACCOMMODATION AND RESOLVING POWER.

"The Mechanism of Accommodation and the Recession of the Near Point" were discussed in a paper by Mr. E. F. Fincham, of the Northampton Polytechnic Institute. He showed that his capsular theory of accommodation, considered in the light of the conception that the zonule forms an elastic suspension of the lens, explained satisfactorily the progressive recession of the near point with advancing age, assuming that the significant change in the mechanism is sclerosis of the lens substance. Such a change necessitates greater ciliary-muscle contraction for the production of a unit increase in physical accommodation, and therefore it is unnecessary to assume any reduction in the power of the muscle.

A second paper, by Professor H. Hartridge, dealt with "Visual Acuity and the Resolving-Power of the Eye." He considered the effect of the chromatic aberration of the eye in reducing visual acuity, and showed that the focussed image (in white light) was that due to the yellow rays. The diffraction discs, due to the much less intense red and blue rays, were superimposed and spread over a much larger area, so that they were comparatively inappreciable.

A paper on "Some Experimental Observations on the Properties of the Receiving Organs in the Retina" was read by Mr. H. E. Roaf. He described experiments on hue discrimination by normal and colour-blind eyes, and some measurements of the Weber-Fechner fraction when the eye was stimulated by light from very restricted regions of the spectrum.

The meeting concluded with a paper by D. F. Roessler, of Bolzano (Italy), entitled "A Subjective Examination of Eye Astigmatism," in which the author described examination for the correction of astigmatism by a subjective method, i.e., one using the patient's reports regarding the appearance of a given test object when seen by the aid of correcting lenses.

It will be clear from this brief account of the contents of the various papers presented that a considerable volume of research is now in progress on the many problems of vision. It is difficult if not impossible for the illuminating engineer to keep in touch with the results as they are obtained, especially as publication takes place in an exceedingly wide range of journals, physical, physiological, psychological and general. A periodical review of progress by someone able to cover this very extensive field of literature would be of great benefit, not only to illuminating engineers, but to all who are interested in the fascinating study of the way in which our eyes react to the many and varied stimuli which they receive.

Association of Public Lighting Engineers

Ninth Annual Meeting and Conference. Blackpool, September 5th-8th, 1932

WE have now before us the provisional programme of the ninth Annual Meeting and Conference of the Association of Public Lighting Engineers, which is to take place in Blackpool during September 5th-8th, 1932.

We give below a summary of the proceedings:—

MONDAY, SEPTEMBER 5th.

Arrival at Blackpool.

5 p.m. Council Meeting at the Imperial Hotel.

7-30 p.m. Formal Opening of the Exhibition of Lamps and Lighting Appliances at the Imperial Hotel by the Mayor of Blackpool. (Short Addresses followed by light refreshments).

TUESDAY, SEPTEMBER 6th.

10 a.m. Official Welcome and Opening of Conference at the Imperial Hotel.

Induction of New President.

Delivery of Presidential Address by Mr. HAROLD DAVIES.

Presentation of Paper by Councillor R. H. MINSHALL on "The Administration of Public Lighting."

1 p.m. Members will be entertained to Luncheon at the Imperial Hotel by the Blackpool Corporation.

2-30 p.m. An Address descriptive of the Exhibits will be delivered in the Conference Room. Members will subsequently proceed to the Exhibition, in the Basement of the Hotel, which will be available for inspection throughout the afternoon. Printed particulars of Exhibits will be available.

WEDNESDAY, SEPTEMBER 7th.

10 a.m. ANNUAL MEETING and Transaction of Formal Business.

A Paper, entitled "The Planning of Gas Installations to conform with the British Standard Specification for Street Lighting," will be read by Mr. FREDERICK C. SMITH, M.Inst. Gas E., F.C.S. (Gas Light & Coke Co.). (A Paper on similar lines dealing with Electric Lighting is in the course of preparation.)

1 p.m. The Association Luncheon will take place at the Imperial Hotel.

2-30 p.m. A Series of Papers dealing with the Lighting of Towns of Small and Medium Size will be presented by Mr. H. COLLINS

(Colchester), Mr. I. H. MASSEY (Oldham), Mr. J. H. CLEGG (Burnley). A contribution is also expected from Mr. J. P. BLACKMORE (Bombay Gas Co.).

(It is proposed that the Exhibition will be open to the Public during Wednesday, September 7th.)

THURSDAY, SEPTEMBER 8th.

No Conference Business will be arranged, so that Members may have the opportunity of visiting various places of local interest.

The evenings will be free for Members to make their own arrangements.

We have been asked to draw the attention of members, delegates and exhibitors to the following points which should receive attention at once* :—

(1) Intimations of attendance, if not yet sent in, should be dispatched at once to the Hon. Secretary (Mr. J. S. Dow), 32, Victoria Street, London, S.W.1).

(2) Badges for the use of members and delegates (3s. 6d. each) can now be ordered, and should be used for purposes of identification.

(3) Visitors are asked to make it quite clear whether they desire to attend (a) the reception, (b) the Association's luncheon, and (c) the luncheon given by the Blackpool Corporation.

(4) Accommodation should be booked early. The headquarters will be at the Imperial Hotel, but particulars of others accompany the programme.

(5) Railway vouchers, enabling return tickets to be obtained at the rate of one and a third times single fare are obtainable. (Such tickets will be available from September 3rd-12th inclusive—an advantage for those who wish to extend their stay).

(6) Firms participating in the Exhibition should send in particulars of their display without delay.

(7) Information illustrating progress in public lighting, for use in preparing the Annual Report, should be sent in to the Hon. Editor of the Association (Mr. E. J. Stewart, 20, Trongate, Glasgow).

It is particularly desirable to get information on two points: (1) the effect of the present financial stringency upon lighting conditions, and (2) the extent to which the use of the British Standard Specification for Street Lighting has influenced contracts and procedure in connection with public lighting.

* The limiting date given officially for the receipt of this information was August 1st.

Illumination and Entertainment

BY AN ENGINEERING CORRESPONDENT.

THE sixth Congress of the International Federation of Cinematograph Exhibitors, being on this occasion held in London, was combined with the Summer Conference of the Cinematograph Exhibitors' Association of Great Britain and Ireland and with a trade exhibition of Apparatus.

The exhibition entirely filled the large underground dance hall of Grosvenor House, where the absence of daylight illumination was convenient in enabling lighting effects to be continuously demonstrated. The conference was opened by a welcome to the visiting delegates by Mr. Stanley Baldwin, and was followed by a reception by the Lord Mayor at the Mansion House.

Subjects such as those discussed at the conference, "Film Rentals," "Censorship," "Hands Off the Cinema," etc., and the work of the nine committees dealing in private session with such diverse and detailed questions as "The Educational Film," "Copyright," "Standardization of Systems," "Technical Problems," "Legislation," "Editing of Films," "The Sound Picture," etc., etc., are beyond the scope of this journal, but the exhibition made abundantly clear the important field for application of artificial light presented by the cinema.

Some illumination devices make an evident appeal to the public, others may be less obvious but of even greater importance. Prominent among those of general attraction is undoubtedly "colour lighting," of which two good examples were seen. The Holophane stage and auditorium illumination was seen in continuous operation, the colour changing gradually in consonance with appropriate music coming apparently from a miniature Wurlitzer stage organ. (This demonstration served as an introduction to an effective large-scale "dance, colour and rhythm" display given to those interested in the Holophane Demonstration Theatre.) Somewhat similar lighting effects were staged by the "Seecol" system, a feature being the alteration in design effect by variation of the colour of the light projected on the curtain. The firm responsible recently carried out the stage lighting at the Shakespeare Memorial Theatre, using among many special designs the "Stelmar" spot lanterns for forestage and acting area, a method of incandescent lamp projection unit similar to that utilized during the flood-lighting of London last September for displaying the figure of Nelson on his column in Trafalgar Square.

Signs for exterior use, such as the "Electric News Panel," with from 574 small lamps upwards, according to the number of words desired to be visible at one time, will infallibly by the running motion of the message always attract attention, although the fixed-letter sign, with or without visible light source, continues to have useful applications. Many novel patterns of attractive letter signs were shown, as well as signs constructed of filament or gasfilled tubes, which, owing to their first cost, will continue to compete with the moving sign.

Interior signs, both of the "Neonlight" self-contained box pattern (complete with built-in transformer, and attachable to any appropriate alternating-current lighting outlet) and of the "K.F.M." internal-reflection design, have wider applications than those in cinema halls. The "Internalite" clock faces shown should make a strong appeal. "Violite" low-tension tubular signs were shown for the first time, striking features being the delicacy of coloration and ability to be used direct on either continuous or alternating-current lighting services.

Numerous fittings, for decorative effect, in the public parts of the up-to-date cinema palace, or in

its offices, and for use on floor, ceiling or wall, were shown, some embodying new materials and striking design.

The more technical uses of light in cinema work are associated with the projection apparatus. Here the arc lamp still remains pre-eminent, although for small hall and educational films it may in the future be displaced by the incandescent lamp. High-intensity arc lamps, of British make, some constructed under licence from the American patentees, were on view. It is evident that the present-day requirements and difficulties of projection have received careful study. Adequate attention is now being paid to the correct burning of the arc, meters indicating its voltage being furnished as permanent attachments to the housings. Facilities are also provided for adjusting, from a point on the lantern, the speed of the feeding motor of the automatic-feed projectors. In the "Ross" lantern a periscope throws a picture of the burning arc on a small screen at the side of the lantern marked with two lines indicating the correct position and length of the arc for best working. In the latest form of "Kalee" lantern a fixed picture lamp with slide carrier forms part of the moving-picture housing, enabling the projectionist to change rapidly over, and also to use the same port for his throw.

Whether the low, the medium, or the high intensity arc is to be adopted is still a matter of discussion, the choice being affected by the greater care given to the making of the carbons, the improvement of the optical qualities of the projector, the transparency of the film stock, and many other details. In connection with the optical side it was of interest to see the Taylor, Taylor & Hobson lenses of the highest technical design widely adopted, and that attention had been specially paid by Hummel to the drastic conditions imposed on the optical glassware. A lens pitted with molten copper particles, from the sheathing of the carbons, was otherwise undamaged, the same immunity was also obtained in the mirrors used in many forms of projectors.

The study of the arc-lamp carbon had been for some years neglected. Now, however, owing to the improvement in the photographing and projection of films, and the desire to use ordinary properties and costumes in the film studio, daylight-arc illumination is a necessity, even though panchromatic emulsions may be used. The exhibit by the Champion firm, the makers of the "Ship" carbons, whose works we described in a previous issue, is of particular interest in this connection. A feature was the demonstration of the integrating spectrograph used in their works laboratory, whereby the true "photocity" of any carbons under review may be demonstrated.

By fluorescence, the whole of the spectrum from 23 to 70 Angstrom units can be seen, whilst by the integrating device the true effectiveness of the light for photographic purposes can be viewed and recorded. A notable improvement in carbons resulting from the use of this apparatus was demonstrated, the spectrum being a "brush-over" without any pronounced visible spectral lines. With the production of correct mixture carbons and their consumption under proper conditions of current, arc voltage, ventilation, length of arc, etc., this source of light should find increasing application in the cinema world, and may form the medium for introducing the overdue coloured film.

The photoelectric cell was also in evidence at this comprehensive exhibition, owing to its extensive use in sound recording. Like the mercury-arc rectifier exhibited by the Hewitt Company, and the switchgear shown by several firms, this must be considered an accessory to the lighting sources, with which this article primarily deals.

J. E.

Literature on Lighting

(Abstracts of recent articles on Illumination and Photometry in the Technical Press)

(Continued from Page 188, July, 1932).

Abstracts are classified under the following headings: I, Radiation and General Physics; II, Photometry; III, Sources of Light; IV, Lighting Equipment; V, Applications of Light; VI, Miscellaneous. The following, whose initials appear under the items for which they were responsible, have already assisted in the compilation of abstracts: Miss E. S. Barclay-Smith, Mr. W. Barnett, Mr. S. S. Beggs, Mr. F. J. C. Brookes, Mr. H. Buckley, Mr. L. J. Collier, Mr. H. M. Cotterill, Mr. J. S. Dow, Dr. S. English, Dr. T. H. Harrison, Mr. C. A. Morton, Mr. G. S. Robinson, Mr. J. M. Waldram, Mr. W. C. M. Whittle and Mr. G. H. Wilson. Abstracts cover the month preceding the date of publication. When desired by readers we will gladly endeavour to obtain copies of journals containing any articles abstracted and will supply them at cost.—ED.

I.—RADIATION AND GENERAL PHYSICS.

173. Realisation of Black Bodies at the Boiling Temperature of Metals. T. N. Panay.

Comptes Rendus, 194, pp. 2198-2200, June 20th, 1932.

The author has undertaken measurements on black-body radiation at temperatures equal to the boiling-point of metals instead of the usual melting-point. A description is given of the apparatus already used for work at the boiling-point of zinc (1180° K), and also of a slightly different form at present in construction for work at higher temperatures, with which lead, silver and tin will be used (boiling-points 1800° K, 2230° K, and 2540° K).

S. S. B.

II.—PHOTOMETRY.

174. A New Photometer. Anon.

Licht u. Lampe, 21, p. 183, 1932.

This photometer, which has the advantages of being light and compact, is also accurate and inexpensive. A glass plate silvered in parallel strips is used for the photometric comparison. The light to be measured falls on to a reflecting sphere, and thence is again reflected by the silvered strips of glass. The comparison light falls on to a similar sphere, and is then transmitted directly through the non-silvered strips of glass.

E. S. B-S.

175. The Rational Use of a Luxmeter. H. Pécheux.

R.G.E., 31, pp. 866-872, June 25th, 1932.

Describes in detail and discusses mathematically the use of the lux- or foot-candle-meter. A refined form of the apparatus, utilizing a black box enclosing the meter, is described, and reference is made to a method of determining the candle-power of a lamp by means of a lux-meter and by reference to a given diagram.

W. C. M. W.

176. Reflecting and Transmitting Substances and their Study, and a New Measuring Apparatus. R. Weigel and W. Ott.

Zeits. f. Instrumenten., Vol. 51, pp. 1-19 and 61-77, January, 1932; also *Revue d'Optique*, February, 1932, p. 77.

The authors discuss the general problems of diffuse and regular reflection and transmission and review the historical work on their measurement, in particular that relating to the spatial distribution of light after reflection or transmission.

A precision apparatus is described for the investigation of the spatial distribution of flux, comprising two arms rotating about a vertical axis, one carrying an illuminating system and the other a photometer of the Bechstein type. The rotatable specimen holder is carried on the vertical rod, the plane of the specimen being vertical. Provision is made for the investigation of effects at different wavelengths by the use of suitable filters, polarization effects, diffuse illumination, etc.

J. M. W.

177. Rapid Spectrophotometry with Bi-multiple Spectra and a New Type of Wedge Cell. F. Twyman, L. J. Spencer and A. Harvey.

Trans. Opt. Soc., Vol. XXXIII, No. 2, pp. 37-54, 1931-32.

A slit diaphragm for spectrographs is described by means of which the process of obtaining the absorption curves of liquids and solids is greatly facilitated. Its application to emission spectrography is considered. A new cell for absorption spectrography is also described.

F. J. C. B.

178. Diagram for Simplified Floor-level Illumination Calculations. F. Nitzsche.

Licht u. Lampe, 22, p. 195, 1932.

A method is given by means of which the calculation for floor-level illumination can be taken graphically from the polar curve.

E. S. B-S.

179. Contribution to Photometric Terminology. A. Blondel.

R.G.E., 32, pp. 3-5, July 2nd, 1932.

The author discusses the terms "potential de brilliance" and "éclat stellaire." He concludes that the former term is admissible, whilst the latter is liable to become confused. It was suggested that the term "éclairage ponctogène" (point source illumination) be used.

W. C. M. W.

IV.—LIGHTING EQUIPMENT.

180. A Mobile Floodlight. Anon.

El. Rev., 110, p. 948, June 24th, 1932.

A new method of lighting sports grounds and aerodromes has been recently introduced. A 5-kw. floodlight with a ground and polished dioptric lens is mounted on a lorry. Current is supplied from a dynamo driven from the gearbox. The floodlight can be operated by hand.

G. S. R.

181. A New Lampholder. Anon.

El. Rev., 111, p. 19, July 1st, 1932.

Gives an illustrated description of a new porcelain lampholder. All metal parts are plated and large terminals are provided for looping, each with two setscrews. The holder is provided with knock-outs for use with surface wiring and complies with Home Office Regulations.

G. S. R.

182. Ultra-violet Luminaires. H. G. Schiller.

Light, 2, No. 7, p. 27, Summer, 1932.

Photographs are given of a further batch of fittings made by various American manufacturers for use with the small ultra-violet lamps.

C. A. M.

183. A Guide to Handling Neon Tubes. S. Gold.

Signs, V, 9, pp. 422-423, June, 1932.

An article containing practical hints on the determination of lengths of neon tubes, their diameter, colour, voltage, wiring, etc.

J. S. D.

184. Duo-Move Maintenance. H. G. Schiller.*Light, 2, No. 7, p. 27, 1932.*

A photograph shows an industrial fitting, the lower half of which can be removed, cleaned and replaced without the use of a step-ladder. A special claw, operated from ground-level, is employed, and a safety-spring locks together the two parts of the unit.

C. A. M.

V.—APPLICATIONS OF LIGHT.**185. Recommendations on School Lighting. E. Summerer.***Das Licht, 5, 2, pp. 87-89, May 15th, 1932.*

The contribution consists of two sections (1) summarizing the work of the central electro-technical advisory council in the U.S.S.R., and (2) comparing the Russian regulations on school lighting with those in other countries. The Russian rules for artificial lighting bear a general resemblance to those framed elsewhere, but the treatment of natural lighting is remarkable for the adoption of a new factor ($1/\pi \times$ "solid angle projection of visible sky area"), which should attain 1.25 per cent. in classrooms, 1 per cent. in halls, laboratories and workshops, and 0.75 per cent. in recreation rooms, swimming-baths, etc. For classrooms a minimum of 114 lux is prescribed. The second section contains a useful review of principles and rules adopted in England, Russia, Germany and the U.S.A. J. S. D.

186. Church Lighting. D. Winton Thorpe.*Elect., 109, p. 5, July 1st, 1932.*

A photograph illustrates the illuminated interior of a church in the course of relighting. The effects of the new and the old installations are compared.

C. A. M.

187. What Modernized Lighting Did for One Church. Anon.*El. World, Vol. 99, p. 813, May 7th, 1932.*

Two photographs of the interior of a Massachusetts church, before and after the installation of modern lighting equipment, are presented. The salient features of the installation are discussed.

W. C. M. W.

188. Swimming-bath Lighting. Anon.*El. Rev., 110, p. 954, June 24th, 1932.*

The lighting of the new Corporation baths in Doncaster, the swimming-pool of which is illuminated by under-water units, is illustrated. 500-watt 12-in. diameter floodlights are arranged down each side of the bath.

G. S. R.

189. Garden Lighting. A. L. Powell and L. C. Eddy.*Light, 2, No. 7, pp. 20-24, Summer, 1932.*

The lighting of private gardens is discussed in detail. The placing of lamps around tree trunks, behind garden pools and on balustrades, walls, steps, etc., and the possibilities of colour lighting with a cycle of changes are discussed. Various photographs illustrate actual results obtained.

C. A. M.

190. Revealing Beauty of Garden at Night. Anon.*Elect. J., Vol. 29, No. 5, p. 221, May, 1932.*

Describes the floodlighting of gardens at an estate at Abingdon, Connecticut.

J. M. W.

191. Floodlighting of Edinburgh Castle. Anon.*Elect., Vol. 108, p. 798, June 10th, 1932.*

Details are given of the equipment used in the recent floodlighting of Edinburgh Castle. The total load is 176 kw.

C. A. M.

192. Doherty Tower Floodlighted. A. Paulus and A. Sira.*El. World, 99, pp. 1062-1064, June 18th, 1932.*

Describes the floodlighting of the 950-ft. tower on the New Cities Service Building in New York. Photographs are presented.

W. C. M. W.

193. "Daily Express" Building. Anon.*Elect., 108, pp. 867-868, June 24th, 1932.*

Details, with a photograph, are given of the elaborate lighting arrangements in the entrance hall of the new *Daily Express* building. The complete lighting of the whole building is controlled at an enquiry desk in this hall. This desk also houses the indicator of a 75-way luminous call system connected to various offices.

C. A. M.

194. Mount Vernon Memorial Highway. Anon.*Light, 2, No. 7, p. 2, Summer, 1932.*

Particulars are given of the spacing of the lamp standards and a description of the fittings and lamps used in the street lighting of the Mount Vernon Memorial Highway.

C. A. M.

195. Distinctive Lighting Stimulates Progress. Anon.*El. World, 99, pp. 939-943, May 28th, 1932.*

A brief survey of recent progress in residential, commercial and street lighting is given. Numerous lighting installations, both in streets and buildings, are illustrated and described.

W. C. M. W.

196. Eye Specialists Turn to Lighting. Anon.*El. World, 99, pp. 1099-1100, June 25th, 1932.*

Quotes data in order to show how eye specialists are beginning to recognize good lighting as an important factor in correcting and conserving vision.

W. C. M. W.

197. Special Lighting Supplement.*El. Times, 81, June 23rd, 1932.*

This eight-page supplement gives a brief account of the activities of the E.L.M.A. in promoting better lighting. The subjects dealt with include hotel lighting, giving statistics of actual practice and recommending illuminations. The success of E.L.M.A. design courses and particulars of the Architects' Conference are given.

G. S. R.

VI.—MISCELLANEOUS.**198. Reflection Factors of Photographic Papers. C. Dunbar.***Trans. Opt. Soc., Vol. XXXII, No. 5, pp. 184-195, 1930-31.*

Graphs showing reflection factors for gaslight papers with matt and glossy surfaces have been obtained for a fixed direction of view of 30°, this direction being in the plane of incidence. The papers give not only a specular peak, but also a "throwback" peak whose maximum occurs when the directions of incidence and view coincide. As various liquid suspensions also give a "throwback" peak, the peak may have its origin in some kind of scattering effect.

F. J. C. B.

199. The Reflection Factor of Magnesium Oxide. J. S. Preston.*Trans. Opt. Soc., Vol. XXXI, pp. 15-35, 1929-30.*

The paper describes the design and use of a small integrating reflectometer for determining the total reflection factor of a smoked magnesium oxide surface under diffuse illumination. It also shows how the reflectometer may be used for the absolute determination of apparent reflection factors (reflectances) under parallel illumination. F. J. C. B.

200. Sputtered Films of Different Metals. Armand de Gramont.*Rev. d'Optique, Vol. II, No. 3, p. 105, March, 1932.*

A study of the reflection and transmission factors of films of different metals sputtered on glass by different processes, and of their resistance to atmospheric attack. Films of tin show an initial reflection factor of about 0.72, which falls slowly with time. J. M. W.

201. Criteria in Lighting Technique for Window Curtains and Hangings. L. Bloch and H. G. Fruhling.*Licht und Lampe, 10, p. 143, 1932; 11, p. 162, 1932.*

The authors first state generally the practical requirements of window curtains. The paper is then divided roughly into three parts. In the first, seven typical window-curtain materials are chosen, and their optical properties, such as penetrability, absorption and reflection, are measured, results and methods being given. Next the authors deal with the visibility of an illuminated object behind a curtain in varying conditions. Finally, the loss of daylight due to the curtain is discussed. E. S. B-S.

202. On the Determination of the Transmission Factors of Coloured Signal Lenses. H. Buckley.*Trans. Opt. Soc., Vol. XXXII, No. 2, pp. 66-68, 1930-1931.*

The paper contains a theoretical treatment of the subject. F. J. C. B.

The Illuminating Engineering Society of Australia (Victorian Division)

We recently received a note from the Secretary of the Illuminating Engineering Society of Australia (Victorian Division), which is now in its second year of existence and is evidently in a flourishing state. During the 1931 session seven monthly meetings were held, the inaugural address being delivered by Professor E. B. Brown, whilst other members dealt with such topics as "Light and Vision," "Lighting as a Railway Utility," "Stage Lighting," etc. The 1932 programme includes numerous visits to works of interest and an address on "Lighting and Education," by Mr. L. J. Robertson. It is interesting to observe that the monthly meetings are held on the third Tuesday in each month (the date usually aimed at in past years by the Illuminating Engineering Society in London). The session, however, naturally covers a different period, extending from April to October in 1931, and from May to November in 1932.

We look forward to hearing more of the work of our friends in Australia, where illuminating engineering seems to be developing on progressive lines.

Women's Engineering Society

TENTH ANNUAL CONFERENCE.

The above conference has been arranged to take place at University College, Southampton, during September 16th-19th. The chief item on the programme is a discussion on "Careers and Openings for Women in Engineering," in the course of which various fields of work will be surveyed by women engineers who are experts therein. Visits to a liner and the new docks extensions have been arranged, and the Hon. Lady Bailey, Miss Amy Johnson (now Mrs. Mollison), and others will take part in an Air Meeting on September 18th. Further particulars may be obtained from the General Secretary, Miss C. Haslett, 46, Kensington Court, London, W.8.

Lieut.-Commander Haydn T. Harrison informs us that his private address is now Anglia, Old Dover Road, Canterbury (Tel. No.: Canterbury 1025). He still retains his office in London at 4, Iddesleigh House, Caxton Street, Westminster, S.W.1, but, as he is rarely there, letters, etc., should be sent to him at Canterbury.

A Guide to Aerodrome Lighting

A very serviceable "Guide to Aerodrome Lighting" has now been issued, with the approval of the Air Ministry, by the British Standards Institution. In some introductory remarks the evident importance of lighting equipment as an aid to regular night-flying is emphasized, and likewise the value of standardization in a field which is essentially an international one.

Lighting is required to fulfil five main functions, namely (1) to indicate the location of an aerodrome from a distance (by means of beacons), (2) to define the exact shape of the area of land on which it is safe to manoeuvre (by means of boundary lights), (3) to show the direction of the wind in which the pilot must land (by the aid of some illuminated indicator), (4) to warn the pilot of the presence of dangerous obstacles (by means of obstruction lights), and (5) to illuminate the landing area by means of floodlighting.

These five problems are briefly discussed. It is interesting to observe, in connection with landing floodlights, the requirement that at least 900,000 square feet should be illuminated, permitting a circle 900 ft. in diameter to be inscribed within it, with an intensity of illumination on a vertical surface facing the lighting nowhere less than 0.15 foot-candles. Some brief notes on international regulations are included, and a sketch is furnished illustrating the various forms of lighting enumerated above.

The Committee is preparing a British Standard Specification for detailed requirements, but in the meantime this guide should prove of considerable service.

We notice at the end of the booklet a sectional list of about twenty British Standard Specifications that have already been issued dealing with illumination, photometry and lighting equipment. This makes quite a comprehensive series, and illustrates how many aspects of illuminating engineering have proved amenable to standardization during the last few years.

* C.C. (E.L.G.) 7631, post free, 2s. 2d.; obtainable from the British Standards Institution, 28, Victoria Street, London, S.W.1.

The Preservation of Instruments of Historical Importance

Letters have recently appeared in the press over the signatures of Lord Rutherford and others asking for the co-operation of anyone possessing pieces of apparatus likely to be of historical importance.

In 1895 the Institute of Physics appointed a committee to advise on the preservation of such apparatus. This committee is anxious to trace any pieces with which fundamental research in physical science has been carried out, and to arrange for their preservation. The committee has also entered upon the task of drawing up a catalogue of such pieces. Several pieces of great historical importance have already been secured for the nation, and are now housed in the Science Museum, South Kensington, and the response to the letters recently published has brought to light several other important pieces. Some articles describing and cataloguing such pieces are published from time to time in the *Journal of Scientific Instruments*.

It is possible that some of our readers may have such apparatus in their possession or under their charge, and the Secretary of the Institute of Physics, 1, Lowther Gardens, Exhibition Road, London, S.W.7, will be grateful for any information that will assist in tracing such pieces or in completing the catalogue.

For the benefit of future historians of physical science it is desirable to have as complete a record as is possible of the work of British Physicists, and one would naturally like apparatus or instruments connected with illumination to be represented.

Floodlighted Prison Walls

The problem of darkness as an aid to escaping prisoners has been solved at Great Meadow State Prison, Comstock, N.Y., through the installation of directional floodlighting about the walls and buildings. The need of such illumination for protective and policing purposes was brought out during the series of prison breaks and riots which took place throughout the United States of America during the last two years, causing loss of life and considerable property damage.

Previous attempts to provide lighting of prison walls, it is remarked, have too often resulted in spotty and irregular illumination. Guards have been unable to obtain a clear, uninterrupted view of either the inside or outside wall surface and have been hindered by the glare of the lights. The old type of lighting also resulted in the placing of so many lights about the prison grounds that some were always in danger of being tampered with. The primary purpose of the new installation is to project a continuous path of light along both sides of the wall, and thus clearly reveal to the guards any person approaching from inside or out. Floodlights have been mounted beneath the balcony at each guard tower, and external visors prevent all annoying glare to the guards on duty. Three gateway entrances are also lighted. Wall sections lighted by a single floodlight beam vary in length from 250 to 400 feet.

This directional floodlighting affords economy in utilization of light upon certain objective areas, and provides a safety factor, since the switch control for the comparatively few installations is located out of the possible range of damage by prisoners.

Architects' Conference

At a conference of architects and consulting engineers, arranged by Holophane Ltd., in the company's lecture theatre at Elverton Street, on July 7th, a welcoming address was delivered by Mr. H. H. Thompson, and contributions were presented by various members of the staff. Mr. W. T. Dean dealt with sales policy, Dr. S. English with illuminating glassware, and Mr. E. Stroud and Mr. L. M. Tye with various recent developments and practical applications of Holophane products. After lunch had been taken at St. Ermin's Hotel, a pleasing demonstration was staged by Mr. R. G. Williams in the cinema theatre. The possibilities of colour-lighting, both as an adjunct to stage performances and in the auditorium, were attractively illustrated; the demonstration of the influence of varying coloured light on the patterns of curtains, wall-papers and ladies' dresses were particularly striking.

In the course of the afternoon a few remarks were made by Mr. J. S. Dow, who had been invited to attend, and who expressed the hope that architects and consulting engineers would be better represented in the membership of the Illuminating Engineering Society. He emphasized the value of the influence which architects could bring to bear on lighting schemes, especially those involving decorative and artistic effects, and mentioned various ways in which the architect and the illuminating engineer could aid each other.

The programme was concluded by dinner at the Criterion Hotel.

The Film in National Life*

An informative report on the above subject has recently been issued by the Commission on Cultural and Educational Films, established in 1929 as a result of a conference in which some hundred educational and scientific organizations took part. Striking illustrations of the important part played by the film in national life in Austria, Germany, Italy, Japan, Russia and the United States are given, those dealing with agricultural developments being perhaps specially striking. The evident value of the film in preserving records of historical events, as well as in the sciences, is emphasized. It is curious that at present there seems to be no organized film library, and the degree of permanence to be expected from present films is at least a matter of doubt. From an educational standpoint, films can be applied in the classroom, in school halls, or in public cinema theatres. All three methods, as well as travelling vans, have been employed. The difficulty in this country is that at present no machinery for contact between teachers and producers exists. Teachers would like educational films, and firms are willing to produce; but the market is too uncertain and the results too speculative. The report concludes by strongly advocating the establishment of a National Film Institute analogous to the organizations existing in other leading countries. The Institute would be concerned with research, and would act as a clearing-house for information. It should serve as a positive agency to encourage valuable films, but would not be concerned with censorship.

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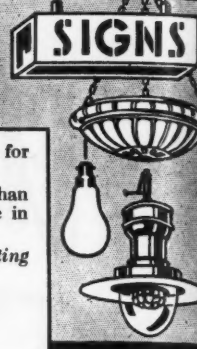
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ACETYLENE LAMPS (150 models).

The Lighting of a Famous Riverside Promenade



The new promenade leading to the Stratford-upon-Avon Memorial Theatre was officially opened recently by the Mayor (Alderman Sir Archibald Flaver).

The promenade and adjacent gardens on the banks of the Avon, when finally completed, will have cost £10,000, and it has been proclaimed to be the finest riverside promenade in Great Britain.

The photograph illustrated above, which has been forwarded by Mr. F. Shewring, Gas Engineer and Manager to the Stratford-upon-Avon Corporation, shows a portion of the promenade lighted by gas. The lamps are fixed at a height of 13 ft. 6 ins., and consist of Messrs. William Sugg & Co.'s "Rochester" lamps (six No. 2 mantles cluster) fitted with "Multi-ray" reflectors. An exceptionally improved result was obtained by the addition of these reflectors, and by setting the reflectors at an angle on two lamps near the entrance steps (not shown on the photograph) the difficulty of effective lighting, partly due to trees, was successfully overcome. The columns are painted to harmonize with the Theatre scheme, as suggested by the architect.

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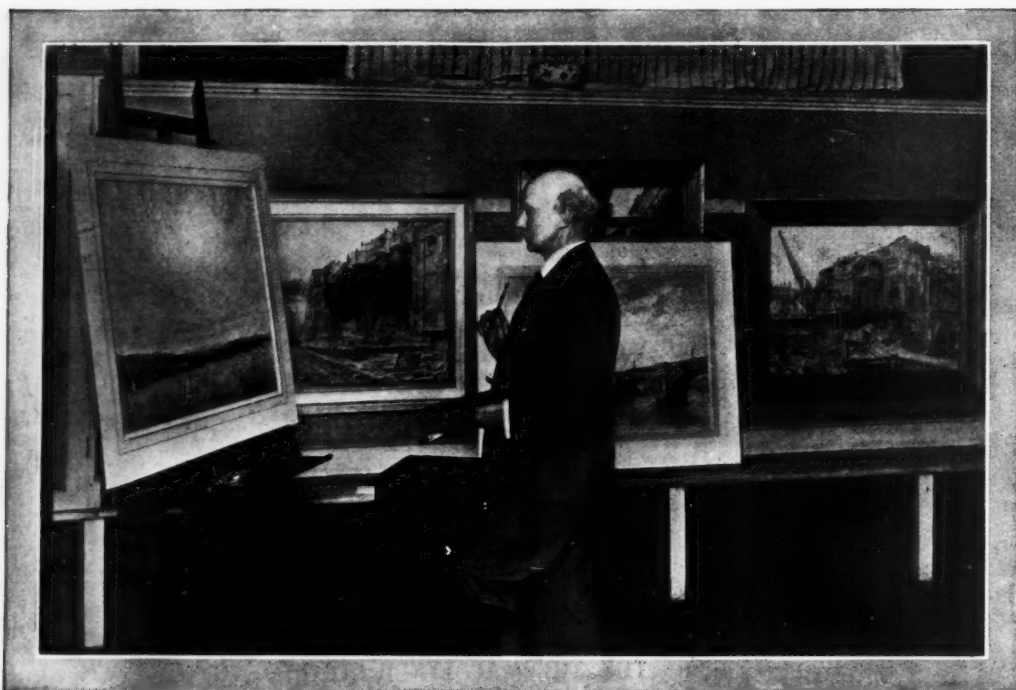
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Particulars of "Contactor System" from
BROOKHIRST SWITCHGEAR LTD., CHESTER.



A corner of Mr. Herbert J. Finn's Studio in Chelsea. This studio is now lighted by gas lamps equipped with special gas mantles which give a light closely approximating in colour to daylight.

"Daylight" Artificial Lighting in the Studio of a well-known Artist

(Communicated.)

TWO points strike anyone who pays a visit to the studio of Mr. Herbert J. Finn, the well-known artist, in Cheyne Walk, Chelsea.

The first is his versatility in his favourite medium, water-colour. Figure work, landscape, flower studies, cloud effects, architecture—all flow easily from his brush.

The second is the influence of the Mechanical Age on his later work. Few contemporaries have done more than he to bring out the beauties of our ancient

architecture—our cathedrals, our castles. But he has also treated the modern scene with conspicuous success—the tracery of steel girders in bridges, the network of pipes in the large chemical works, the colours of metals as they come from the furnace or the melting-pot, the glow of the retort house as cascades of red-hot fuel are discharged.

The Mechanical Age needs its recorders, and Mr. Finn takes high rank among them. Broad effects he always aims at; but in getting those effects he preserves a minute accuracy in all the details of his pictures. The integrity of his art would never permit him to paint the interior of a great steel-works with the mechanical details inaccurately drawn, or to paint a block of metal—a naval gun for example—undergoing a certain heat-treatment process, with a misleading rendering of the colours.

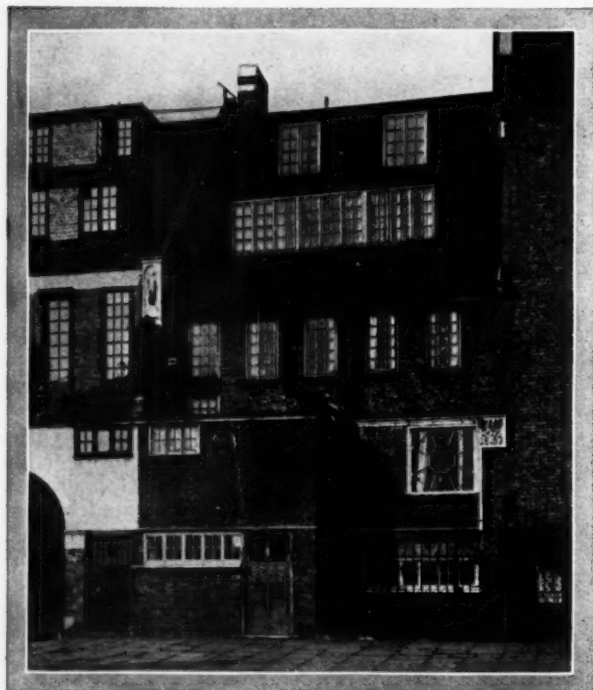
The exhibition of paintings of this nature in an artificial light which distorted the colours, or prevented the details from being seen easily, would obviously be grossly unjust to the artist and also to his subject.

A good artificial light of the right colour is therefore essential if the artist is obliged, in order to finish a work to time, to continue painting at night-time, or if he wishes to exhibit his paintings during the evenings or the dark days of winter.

About a year or so ago arrangements were made to light Mr. Finn's studio by gas. The gas undertaking gave particular attention not only to the even distribution of light throughout the studio but to the provision of a light which was a much nearer approach in colour to daylight than that originally used.

"Daylight" Lighting at Night-time.

In place of the original corona, three gas-lighting fittings of the semi-indirect (bowl) type were fixed. These were arranged in such a manner that the illumination was fairly even throughout the room.



Exterior view of the Copper Door Studio, Cheyne Walk, Chelsea, which is the subject of the accompanying notes.



Mr Finn's studio is 39 ft. long by 24 ft. wide and is lighted by three gas lamps of the semi-indirect type, each equipped with nine gas mantles. These mantles are specially prepared to give out a light which is a close approximation in colour to daylight. With them Mr. Finn can now continue painting during the dark hours if pressed for time.

This illustration gives an idea of the excellent lighting provided in the studio by the gas lamps shown in the upper illustration. The photographs reproduced on this page were taken solely by the light given out by the gas lamps, and neither of the photographs was touched up for reproduction purposes. The studio is lighted at a cost of gas of not more than 3d. an hour.

Further, these lights were equipped with special "day-light" mantles (nine on each lamp). These mantles are the result of research work carried on by the gas industry in order to provide a light which is a fairly close approximation in colour to standard daylight. The "daylight" effect is achieved mainly by a variation of the proportion of rare earths used in the manufacture of the incandescent mantle. It was found that this variation could be obtained without adding considerably to the cost of the mantle and without causing any serious depreciation in the candle-power given out for every cubic foot of gas used.

Painting by Night Made Possible.

A glance at the illustrations on this page will show that the studio is well lighted and free from shadow. In practice the artist finds that the colours in his paintings as seen under this light are almost identical with those colours as seen by daylight. In the accurate blending of colours by artificial light he now experiences no difficulty, and when pressed for time he has no hesitation whatever in carrying on his work by night. So far as detail work is concerned, the light is as nearly perfect for his purposes as it is possible to be. It is free from glare, it casts no shadows on the easel, and is restful to the eyes.

Heating and Ventilating Effect of Gas Lighting.

The quality of the light was the primary reason why gas was installed. Secondary advantages have, however, resulted. The appreciable heat given off by the lights serves a threefold purpose. On many days that heat is just sufficient to keep the room comfortably warm without recourse to the central-heating plant. It also counteracts the downrush of cold air currents from the large glass lights forming part of the roof of the studio, and thus prevents the draughtiness which is frequently experienced in



large rooms and halls with glass roofs which are in contact with the outer air. Further, the gentle upward movement of the air in the room caused by the burning of the gas has a valuable ventilating effect; it prevents any feeling of stuffiness.

Distance Control.

The lights are turned on and off by distance-control switches fixed at a convenient point near the fireplace. The installation is kept in good order by periodical visits of the skilled maintenance men of the gas undertaking.

Economy of Gas Lighting.

The amount of light now provided throughout the studio, though not excessive, is considerably greater than that previously supplied, but Mr. Finn has found that the cost of the lighting has actually been reduced. At the present time he is lighting the room at a total cost for gas of not more than 3d. per hour, when all lights are on.

TRADE NOTES & ANNOUNCEMENTS

G.V.D. Illuminators

We were recently afforded an opportunity of examining several novel lighting appliances on view at the offices of G.V.D. Illuminators, Aldwych House. Of these the G.V.D. pendant unit, which is available in sizes from 10 ins. to 18 ins. in diameter, and for lamps from 60 to 500 watts, has several interesting features. It is based on a combination of a metal reflector and a diffusing-glass envelope of somewhat unusual design, having a "dint" in its lower surface, which plays a material part in modifying the light-distribution. The units on view gave a good downward illumination, notwithstanding the fact that the upper part of the walls and ceiling appeared well illuminated, a feature being the absence of "patchiness" and the softness of effect. This form of unit can be readily adapted to furnish an artificial daylight effect. It is contended a 100-watt lamp, used in a fitting of this nature, will adequately illuminate a room 20 ft. square.

Another novelty is a special unit designed for panel, cornice and lay-lighting. This consists of a boxed-in trough fitting faced with diffusing glass, such as may conveniently be mounted in the angle of one wall and the ceiling, i.e., with the glass screen at an angle of 45°. To give even brightness to the glass and effectively illuminate a room 20 ft. square, probably at least five 100-watt lamps would be needed in the ordinary way. With the G.V.D. system, however, the effect is obtained by means of a single 100-watt lamp mounted at one extremity of the fitting and equipped with a concentrating reflector. Diffusing curved reflecting surfaces, mounted along the side of the trough facing the glass, also play their part in producing uniform brightness of the diffusing glass.

A New Sodium Light

We have received information of a new form of lamp, in which Messrs. Philips Lamps Ltd. are interested, giving a sodium yellow light and apparently operating without any filament, the lamp containing merely metallic sodium in a gaseous atmosphere. It is stated to yield approximately 6 candles per watt, and though the monochromatic nature of the light is naturally a limitation, it is believed to have useful applications, particularly in the lighting of arterial roads.

We shall await further details with interest.

Decorative Electric Lighting

The use of such materials as Rhodoid, Marbloid, Parchment, etc., in decorative electric-light fittings has become very usual, and a leaflet issued by Messrs. Siemens Electric Lamps & Supplies Ltd. therefore makes a timely appearance. Many forms of pendant, table standard and bed-light shades are illustrated, and considerable range of style and colour is shown. The use of these materials for bowl fittings is perhaps less familiar. In this list, however, quite a number of effective examples are shown. We have also to acknowledge the receipt of the revised catalogue (No. 900) of Siemens Electricity Meters.

Fifty Years of Service

Under this title a modest little booklet records the jubilee of Messrs. Falk, Stadelmann & Co. Ltd., whose business commenced in January, 1882. In that year Mr. Salomon Falk, the founder of the business, issued the first price-list, a four-page leaflet notifying the trade that he had established himself as a "manufacturer's agent for gas fittings, opal shades and gas burners." Mr. Max Falk, now chairman of the company, entered the business in January, 1883, and the late Mr. Victor Falk in the following year. In conjunction with Mr. McClelland, one of the present directors, he established the oil-lamp section of the business. The present managing director, Mr. L. Thurner, joined the firm in 1886. The board thus serves as a very good instance of long and successful service.

The business was subsequently transferred to Basinghall Street, to Hatton Garden, and ultimately to its present site in Farringdon Road. Following the discovery of the incandescent mantle, the "Veritas" mantle was introduced in 1902, and the factory at Wandsworth erected in 1919. A feature of the subsequent career of the company has been the readiness with which it took up each new development in lighting, so that to-day it deals alike with oil, gas and electric appliances. Electrical fittings are manufactured at Birmingham, and gas, electric and oil-heating and cooking apparatus at Rainhill, Lancs.

Branches have been opened in Manchester (1921), Cardiff and Newcastle-on-Tyne (1926), Dublin (1927), and Leeds and Liverpool (1930).

Contracts Closed

The following contracts are announced:—

THE BRITISH THOMSON-HOUSTON CO. LTD.:—
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SIEMENS ELECTRIC LAMPS AND SUPPLIES LTD.:—
H.M. Office of Works; for 12 months' supply of Siemens electric lamps.

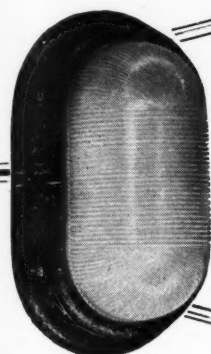
Great Western Railway; for 12 months' supply of Siemens gasfilled lamps.

Royal Mail Steam Packet Co.; for Siemens gasfilled lamps.

Union Castle Mail Steamship Co. Ltd.; for six months' supply of Siemens vacuum and gasfilled lamps.

HOLOPHANE LTD.:—

Amongst recent contracts announced by Messrs. Holophane Ltd., are those for Holophane refractor units in connection with the *Seacombe Ferry Improvement Scheme (Wallasey Corporation)*; for the overhead lighting of *Thornton Heath Baths*; and for the lighting of the windows and furnishing department of the *South Suburban Co-operative Society*.



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Institute of British Decorators

CONFERENCE, JULY 20TH-22ND.

A conference arranged by the Institute of British Decorators took place in the Printers' Hall, London, during July 20th-22nd. We hope in our next issue to say something more about the proceedings. For the moment we need only comment briefly on the programme, which was arranged in a novel and interesting way.

The conference was officially inaugurated by Sir Francis Goodenough, C.B.E., on the opening day, when numerous lectures illustrating the trend of decorative art were delivered. There were thirteen lectures on the list, including one by Mr. Herbert Pride on "The Part of Lighting in Interior Decoration." The discussions were supplemented by visits to the new Broadcasting House, the Wallace Collection, Courtaulds Ltd., Imperial Chemical House, etc. There was also a reception at the Mansion House, when Mr. Sydney Tachell, F.R.I.B.A., the architect responsible for the recent renovations, personally conducted the party.

Novel features in the printed programme were the series of biographical notes accompanying the reference to each lecturer and brief descriptions of the salient features of the various buildings to be seen. Under the title "Adventures in London," numerous other buildings—showrooms, offices, cinemas and hotels—were mentioned as worth a visit.

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The Journal of GOOD LIGHTING

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Published on the 1st of the month.

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SPECIAL INFORMATION.

THE ILLUMINATING ENGINEER (the Journal of GOOD LIGHTING) was founded in January, 1908, and has thus been in existence for twenty-four years.

SINCE the year 1909, when the Illuminating Engineering Society was founded in London, it has been the official organ of the Society.

It is *the only journal in this country exclusively devoted to Lighting by all Illuminants.*

It receives the assistance of contributors who are leading experts on illumination in this country and abroad. Foreign Notes and News will be a speciality, and correspondents have been appointed in all the chief cities of the world.

THE Journal contains *first-hand and authoritative information on all aspects of lighting*; it has also been improved and extended by the inclusion of a *Popular and Trade Section* containing special articles of interest to contractors, gas and electric supply companies, Government Departments and members of the Public.

DISCUSSIONS before the Illuminating Engineering Society which are reproduced in this Journal are participated in alike by experts on illumination and *users of light*, whose co-operation is specially invited.

Good Lighting is of interest to everyone. The Journal is read by engineers, architects, medical men, factory inspectors, managers of factories, educational authorities, public lighting authorities, and large users of light of all kinds.

BESIDES being issued to all members of the Illuminating Engineering Society, the Journal has an independent circulation amongst people interested in lighting in all parts of the world. The new and extended form of the Journal should result in a continual and rapid increase in circulation.

Every reader of THE ILLUMINATING ENGINEER, the Journal of GOOD LIGHTING, is interested in illumination, and is a possible purchaser of lamps and lighting appliances. Gas and Electricity Supply Undertakings likewise benefit by the movement for Better Lighting, with which the Journal is associated, and which stimulates the demand for all illuminants.

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The Society preserves an impartial platform for the discussion of all illuminants, and invites the co-operation both of experts on illumination and users of light; it includes amongst its members manufacturers, representatives of gas and electric supply companies, architects, medical men, factory inspectors, municipal officers, and many others interested in the use of light in the service of mankind.

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